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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/029,608	05/15/1998	NORIO FUKASAWA	980233	6285

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EXAMINER

GRAYBILL, DAVID E

ART UNIT PAPER NUMBER

2827

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/029,608

Applicant(s)

FUKASAWA ET AL.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 109-112, 115, 116, 119, 120, 123, 127 and 129-135 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 109-112, 115, 116, 119, 120, 123, 127 and 129-135 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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The amendment to the claims filed 10-25-2 is non-compliant because it fails to conform to the provisions of 37 CFR 1.121(1)(c)(ii):

If a claim is amended by rewriting such claim with the same number, the amendment must be accompanied by another version of the rewritten claim, on one or more pages separate from the amendment, marked up to show all the changes relative to the previous version of that claim.

Specifically, the amendment is not accompanied by another version of rewritten claim 110, marked up to show the deletion of the term "element" relative to the previous version of claim 110.

Because this is a minor deficiency, and in order to further afford applicant the benefit of compact prosecution, the requirement to comply with the rule within a one month time limit is waived, the amendment is entered, and the claims are examined on the merits.

The amendment to the claims filed 10-25-2 is non-responsive to the Office action filed 7-25-2 because it fails to conform to the provisions of MPEP 714.03:

714.03 Amendments Not Fully Responsive - Action To Be Taken: Where a bona fide response to an examiner's action is filed before the expiration of a permissible period, but through an apparent oversight or inadvertence some point necessary to a complete response has been omitted - such as an amendment or argument as to one or two of several claims involved or signature to the amendment - the examiner, as soon as he or she notes the omission, should require the applicant to complete his or her response within a specified time limit (usually one month) if the period for response has already expired or insufficient time is left to take action before the expiration of the period. If this

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is done the application should not be held abandoned even though the prescribed period has expired.

Specifically, in claim 119, the rejection directed to the language, "the end portions of the protruding electrodes that protrude from the resin layer" has not been addressed.

Because the response appears to be bona fide, but through an apparent oversight or inadvertence the response is incomplete, and in order to continue to afford applicant the benefit of compact prosecution, the requirement to complete the response within a one month time limit is waived, the amendment is entered, and the claims are examined on the merits.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 115, 116, 119, 120 and 129 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 115 the limitation, "the internal pad" is unclear because the limitation refers to an "internal pad" but there is no apparent previous claim-recitation of an internal pad.

In claim 119 the limitation, "the end portions of the protruding electrodes that protrude from the resin layer" is

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unclear because the limitation refers to electrodes "that protrude from the resin layer" but there is no apparent previous claim-recitation of electrodes that protrude from the resin layer.

Claim 129 is rejected under 35 U.S.C. 112, second paragraph, as incomplete because it depends on canceled claim 128. See MPEP 608.01(n)V.

Claims 115, 116 and 129 have not been rejected over the prior art because, in light of the 35 U.S.C. 112 rejections supra, there is a great deal of confusion and uncertainty as to the proper interpretation of the limitations of the claims; hence, it would not be proper to reject the claims on the basis of prior art. As stated in *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962), a rejection should not be based on considerable speculation about the meaning of terms employed in a claim or assumptions that must be made as to the scope of the claims. See also MPEP 2173.06.

In the rejections infra, reference labels are generally recited only for the first recitation of identical claim language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 109-112, 131, 134 and 135 are rejected under 35 U.S.C. 102(e) as being anticipated by Yasunaga (5656863).

At column 1, line 1 to column 2, line 5, column 2, lines 37-57, column 3, lines 7-47, column 16, line 16 to column 18, line 12, and column 25, lines 44-47, Yasunaga teaches the following:

109. A semiconductor device comprising: a semiconductor element 113 having a surface on which protruding electrodes 112 are formed; a resin layer 111 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes 53b provided to the end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than a height of said protruding electrode for a part thereof protruding beyond said resin layer.

110. The semiconductor device as in 109, wherein both a side portion of the resin layer 121 and a side portion of the semiconductor 125 are respectively exposed.

111. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes having convex end portions are formed; a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except the convex end portions thereof; and external connection protruding electrodes provided to the convex end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than a height of said protruding electrode for a part thereof protruding beyond said resin layer.

112. The semiconductor device as in 111, wherein both of a side portion of the resin layer 121 and a side portion of the semiconductor element 125 are respectively exposed.

131. A semiconductor device comprising: a semiconductor element 3 having a surface on which protruding electrodes 9, 10 are formed; a compression-molded resin layer 1 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof ("top surface of the first conductor 9"); and external connection protruding

electrodes 10 provided to the end portions of the protruding electrodes that protrude from the compression-molded resin layer, the compression-molded resin layer and the semiconductor element having surfaces.

134. The semiconductor device as claimed in 109, wherein said resin layer is a compression-molded layer.

135. The semiconductor device as claimed in 111, wherein said resin layer is a compression-molded layer.

To further clarify the teaching of the bump having a height larger than a height of the protruding electrode for a part thereof protruding beyond the resin layer, it is noted that the scope of the claims is not limited to a particular frame of reference. In addition, the bump extends beyond both the electrode and the resin layer. Therefore, it is inherent that there is a frame of reference wherein the bump extends a height larger than a height of the protruding electrode for a part thereof protruding beyond the resin layer.

To further clarify the teaching of the process limitations, "wherein the resin layer and the semiconductor element have surfaces defined by cutting using a dicer," and, "wherein said resin layer is a compression-molded resin layer," the product of Yasunaga inherently possesses the structural characteristics

imparted by these process limitations. See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980).

Claims 119 and 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Karnezos (4813129) and Yasunaga (5656863).

At column 5, line 42 to column 7, line 27, Karnezos teaches the following:

119. A semiconductor device comprising: a semiconductor element 12 having a surface on which electrode pads ["contact pads"] connected to an internal part of the semiconductor element and protruding electrodes 16c to be connected to an external part are formed; lead lines 46c each connecting one of the electrode pads ["traces terminating at contact pads"] and one of the protruding electrodes so that the protruding electrodes and the internal part are connected through the lead lines; and an insulating layer 42c formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes 50c provided to the end portions of the protruding electrodes that protrude from the resin layer, the protruding electrodes having a core portion 18c and an electrically conductive film 20c formed on a surface of the core portion, the core portions

of the protruding electrodes are directly formed on the lead lines, wherein the core portion comprises an elastic resin.

120. The semiconductor device as claimed in 119, wherein the elastic resin is polyimide.

To further clarify the teaching that the electrode pads are connected to an internal part of the semiconductor element and the protruding electrodes and the internal part are connected through the lead lines, it is noted that it is inherent that the semiconductor element comprises an internal part, and the pads, internal part, protruding electrodes, and lead lines are at least physically connected to each other.

However, Karnezos does not appear to explicitly teach that the insulating layer 42c is a resin layer.

Notwithstanding, at column 32, lines 27-44, Yasunaga teaches a resin insulating layer 1. In addition, it would have been obvious to combine the product of Yasunaga with the product of Karnezos because it would provide an insulating layer.

Claims 123, 127 and 130 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishino (JP555278).

In the English abstract and figures, Nishino teaches the following:

127. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes 5 are formed;

and a molded resin layer 3 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, wherein the molded resin layer and the semiconductor element have the structure of surfaces defined by cutting using a dicer.

123. A semiconductor device as claimed in 127 wherein a part of a side portion [the top side] of the semiconductor element being covered with the resin layer, a part of a side portion [the bottom side] of said semiconductor element being exposed.

130. The semiconductor device as in 127, wherein end portions of the protruding electrodes protrude from the molded resin layer.

To further clarify the teaching wherein the molded resin layer and the semiconductor element have the structure of surfaces defined by cutting using a dicer, although Nishino does not appear to explicitly teach the process limitations "surfaces defined by cutting using a dicer," the Nishino teaches that the surfaces are cut, and the product of Nishino inherently possesses the structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

Also, although Nishino does not appear to explicitly teach the process limitation "compression-molded," the product of Nishino inherently possesses the structural characteristics

imparted by the process limitation. See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980).

Claims 132 and 133 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hutson (3608186) and McCann (3706129).

At column 4, lines 42-46, column 5, lines 58-64, and column 6, lines 26-41, Hutson teaches the following:

132. A semiconductor device characterized by comprising: a semiconductor element 12 having protruding electrodes 60, 64 formed on a surface thereof: a first passivation layer 40 that is formed on the surface of the semiconductor element and seals the protruding electrodes except for ends thereof; and a second passivation layer 40 provided so as to cover at least a back surface of the semiconductor element, a sidewall surface of said semiconductor element being exposed at a sidewall surface of said semiconductor device.

133. A semiconductor device as claimed in 132, wherein a sidewall surface of said first passivation layer and a sidewall surface of said second passivation layer form a flush surface with said sidewall surface of said semiconductor element.

However, Hutson does not appear to explicitly teach that the passivation layer is resin.

Regardless, as cited, Hutson teaches that glass or "other suitable means for passivation can also be used." Furthermore, at column 5, lines 53-64, McCann teaches that glass and resins are functionally equivalent passivation means. Therefore, it would have been obvious to combine the product of McCann with the product of Hutson because it would provide a passivation means.

Applicant's amendment and remarks filed 10-25-2 have been fully considered, are addressed in the rejection supra, and are further addressed infra.

Applicant also alleges that "the physical property of the 'compression-molded layer' used in the present invention is different from that of the resin layer of Nishino." To support this allegation, applicant refers to "IEEE Transactions on Advanced Packaging."

It is maintained that a rejection under 35 U.S.C. 102 and/or 35 U.S.C. 103 is indicated where prior art discloses a product that appears to be either identical with or only slightly different from the product claimed in a product by process claim. Further, applicant can be required, to prove that the prior art product does not necessarily or inherently possess characteristics of the claimed product. Whether the rejection is based on inherency under 35 U.S.C. 102, on prima

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facie obviousness under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same. When, as here, there is reason to believe that the functional limitation asserted to be critical for establishing novelty in the claimed subject matter is an inherent characteristic of the prior art, the Office possesses authority to require applicant to prove that subject matter shown to be in the prior art does not possess the characteristic relied on. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

To this end, applicant's reference to the cited document is deemed to be unpersuasive because the document does not provide proof; hence, it essentially amounts to mere conjecture. *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the "preliminary identification of a human b - NGF - like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. &

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Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.

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Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/308-7722.



David E. Graybill
Primary Examiner
Art Unit 2827

D.G.
8-Jan-03